

REMARKS

This is a non-final action in which claims 1-3, 7, 8 and 11-16 are pending and under examination. Claim 16 has been amended to correct typographical errors. Claim 16 has been allowed. Claims 14 and 15 have been amended. Claim 15 contained a typographical error and the error has been corrected. The word **acetic** has been spelled correctly before starch. An editorial change has also been made by canceling the word “in” in the next to the last line of claim 15 this word has been substituted with the word “wherein”.

Claim 13 has been canceled without prejudice or disclaimer of the subject matter contained thereof. The amendments to claim 14 have been made in view of the cancellation of claim 13. In all the amendments no new matter has been added.

The rejection of claim 15 under 35 USC §112, second paragraph has been rendered moot by the amendment offered with this response.

The rejection of claims 1-3, 7, 8 and 13-15 under 35 USC §102(b), as anticipated by art or in the alternative under 35 USC §103(a) as obvious over, von Bonin et al is respectfully traversed for following reasons.

Applicant respectfully traverses the rejection of claims 1-3, 7-8 and 13-15 because they are anticipated by the newly cited von Bonin et al, (USP 5,288,429).

The Examiner states, in column 2 and in Example 1 of Bonin et al, graphite is treated with a small amount of starch. However, the reference at column 2, lines 48-55 reads: “It is an essential feature of the present invention that a liquid is added to the expandable graphite and a moist preparation form of the expandable graphite is thus obtained. Preferred liquids for the production of the moist preparation form of the expandable graphite are water or water-containing liquid mixtures. Water-containing liquid mixtures may be, for example, aqueous solutions...”

Such a mixture may contain starches or other various kinds of substances. However, the quantity of starch present is indicated only in Example 1 (column 5, line 35), which is not indicative of the substantial operation of the present invention. In addition, the starch itself used in the cited reference is insoluble into water, so that the 5% aqueous solution of starch itself does not exist, which is different from the solutions of starch derivatives employed in the present invention as referred to in Example 1 on page 11 and in claims 1 and 15 of the present application. The resultant product of the cited reference is expandable graphite which is quite different from the present invention which is a graphite material to form a negative electrode of a lithium ion secondary cell. Therefore, the practical features of the present invention are entirely different from those of Bonin et al, and this reference does not anticipate the presently claimed invention.

Moreover, the Examiner states that claims 2 and 3 appear to encompass sodium impurities in the water and this appears to be a gratuitous assumption and there is nothing in claims 2 and 3 of USP 5,288,429 to suggest any such thing.

The rejection of the claims under 35 USC §102(e) based on JP 09147916 is respectfully traversed for the following reasons.

The abstract of the cited JP 09-147916, Fuji Photo Film Co., Ltd., relates to “a nonaqueous secondary battery composed of a positive electrode and/or negative electrode, which has a protective layer consisting of solid particles and water soluble polymer.” As the solid particles, “inorganic chalcogenide particles (containing at least one member of the oxides of sodium, potassium, magnesium, calcium, strontium, zirconium, aluminum and silicon)” are disclosed, and “polyacrylic derivatives or cellulose derivatives” are referred to as water-soluble polymer. The electrode of the present invention contains none of inorganic chalcogenide particles. The present invention is,

therefore, different from the subject matter of the cited reference, which does teach a protective layer consisting of solid chalcogenide particles.

Furthermore, the Examiner states that it appears to be consistent with the teaching of 0.01% polymer in the specification and thus no differences are seen. There is no upper limit indicated and no specific limit indicated for the weight percent of polymer coating the graphite, so that it is pure supposition on the Examiner's part as to what is the amount of coating on the graphite shown in JP No. 09-147916.

Therefore, we respectfully submit that the present invention is neither taught nor suggested by the cited references. In this connection, references are made to the Declaration of Mr. K. Ohzeki made of record herein (paper no. 22).

The Declaration of Mr. K. Ohzeki shows the critical nature of the layer for protecting the native electrode with an aqueous solution of surface active material in terms of weight percent from 0.01 to 10 wt. % (see page 2 experiment 1 of Declaration of Mr. K. Ohzeki. Also, see table 1 on page 3 of the Ohzeki Declaration). Page 4 of the Declaration set forth table 2, which makes it clear that in range of 0.01 to 10 wt. % the discharge capacities of the electrode increased and the difference in discharge capacities were small. Outside this range, when the surface active material was less than 0.01 wt. % the ratios of discharge capacities and charge were large and the coulomb efficiencies were small.

The results of the testing by Mr. K. Ohzeki speak for themselves according to the present invention without any chalcogenide particles, but otherwise analogous to the conductive particles of graphite as shown in JP 09-147916. The critical range of the coating layer on the graphite particles is shown to be from 0.01 to 10 wt. %. Outside of this range, when the surface active material was less than 0.01 % wt. the discharge and charge capacities and coulomb efficiencies were small. Within the

range of 0.01 to 10 % by wt. of surface active material on conductive graphite the discharge capacities increased and the difference in discharge capacities were small.

The Examiner's attention is directed to the preliminary amendment of June 17, 2002 in the present application wherein claim 1 was amended to include the critical range of 0.01 to 10 % by wt. of the surface active material wherein the weight of the surface active material is based upon the weight of graphite material. The Declaration of Mr. K. Ohzeki is therefore germane to all claims pending and under Examination. Since all claims are either dependent upon claim 1 which carries this limitation or as in the case of claims 15 and 16 the limitation of 0.01 to 10 wt. % is specified in independent claims 15 and 16.

In view of the foregoing arguments and evidence submitted with the Declaration of Mr. K. Ohzeki, reconsideration of the rejection of all claims and favorable action is respectfully solicited. It is respectfully urged that all claims are now directed to patentable subject matter.

Should the Examiner wish to contact the Applicant's representative he may do so by telephoning the undersigned in the Washington metropolitan area at the number indicated below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made



VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 13 has been canceled

The claims have been amended as follows:

14. (Amended) The graphite material for the negative electrode according to claim 1 [13], wherein said graphite material absorbs or is coated with an aqueous solution [contains] containing either ion-exchanged water, or hot-spring water, or underground water, or well water or city water, any one of which contains lithium, calcium, magnesium, sodium or potassium.

15. (Amended) 15.(Amended) A graphite material for use in forming a negative electrode of a lithium ion secondary cell which is capable of occluding or releasing lithium ions, wherein said graphite material has adsorbed or is coated with a layer of surface active material that (1) has not been graphitized by heat treatment and (2) consists essentially of at least one member selected from the group consisting of [acidic] acetic starch, phosphoric starch, carboxymethyl starch and hydroxyalkyl starch [in] wherein the amount of said surface active material is present in a range of 0.01 to 10.0 wt. % based upon the weight of graphite material.

16. (Amended) A graphite material for use in forming a negative electrode of a lithium ion secondary cell which is capable of occluding or releasing lithium ions, wherein said graphite material has adsorbed or is coated with a layer of surface active material that (1) has not been [graphatized] graphitized by heat treatment and (2) consists essentially of at least one member selected from the group consisting of pullulan and dextrine, wherein the amount of said surface active material is present in a range of 0.01 to 10 wt. % based upon the weight of graphite material.